Ruckus ICX 7650

Enterprise-Class Stackable Access/Aggregation Switch

DATA SHEET

BENEFITS

DUAL PURPOSE FOR PREMIUM ACCESS OR 1G/10G AGGREGATION SWITCHING

40GbE AND 100GbE FOR MAXIMUM PERFORMANCE AND FUTURE-PROOFING

- Up to 2x 40 GbE uplink or 4x 40GbE stacking ports
- Up to 2x 100 GbE uplink or stacking ports

MULTIGIGABIT FOR 802.11AC WAVE 2 DEPLOYMENTS AND BEYOND

- Up to 24x 1/2.5/5/10G Multigigabit Ethernet ports

REDUNDANT, LOAD-SHARING POWER SUPPLIES ENHANCES AVAILABILITY

POWER NEXT GENERATION POE DEVICES

- PoE+/802.3bt* up to 90W per port
- Up to 1500W PoE budget with two power supplies

ADVANCED L3 ROUTING DELIVERS DESIGN FLEXIBILITY

- IPv4 and IPv6
- BGP, OSPF, VRRP, PIM, PBR, VRF

CAMPUS FABRIC REDUCES COST OF OPERATIONS, SIMPLIFIES MANAGEMENT

- Delivers the benefits of a chassis with the flexibility of distributed stacking
- Scales to 1800 ports

SECURITY AND DATA PRIVACY

- MACsec 128-bit and 256-bit data encryption ensures compliance and data confidentiality

* Up to 90W per port, IEEE 802.3bt standard pending ratification. Compatible with uPoE.

HIGH PERFORMANCE MULTIGIGABIT ACCESS AND AGGREGATION SWITCHES WITH 100GbE SUPPORT

Enterprise networks are no longer confined to providing simple VoIP phone connectivity and access to email and the internet. Today, seamless mobility, Bring Your Own Device (BYOD), social media, web based video conferencing, cloud based SaaS applications and Big Data analytics are all contributing to an environment that demands greater performance and flexibility from the wired and wireless network.

Furthermore, with the rapid adoption of 802.11ac Wave 2 Wi-Fi access points, as well as emerging new Wi-Fi standards, can generate multiple gigabits per second of wireless traffic. As mobile devices usage grows exponentially, they push an ever-increasing volume of traffic through the wired edge and new high-performance access points draw more PoE power from edge switches. The wired edge is gradually morphing into a wireless traffic aggregation layer requiring higher performance, availability, and more advanced features.

The Ruckus® ICX® 7650 Switch is designed to meet the new challenges of the multigigabit wireless era. It delivers non-blocking line rate performance, high availability, and scalability with Multigigabit Ethernet access, high PoE output as well as 10 Gigabit Ethernet Aggregation and 40G/100G uplink options.

GIGABIT AND MULTIGIGABIT ACCESS SWITCHES

The Ruckus® ICX® 7650 stackable access switches come in Gigabit and Multigigabit versions. Both come standard with 40G and 100G ports for stacking. The Gigabit model offers 48x 10/100/1000 Mbps ports with 40G uplinks, the Multigigabit model offers 24x 10/100/1000 Mbps ports and 24x 100/1000 Mbps/2.5/5/10 Gbps with 40G/100G uplinks for future ready next generation wireless deployment. Both switches deliver non-blocking line rate performance and offers PoE+, 802.3bt* with up to 1500W of PoE budget with two hot-swappable load-sharing power supplies. The switches are targeted at demanding enterprise customers who need a high performance, highly reliable access switch at the edge of a campus network or as top of the rack switch in the data center.

1G/10G AGGREGATION SWITCH

The stackable ICX 7650 aggregation switch comes standard with 40G and 100G ports for stacking and/or uplinks and dual hot-swap power supplies for maximum reliability. The switch offers 24x 1/10GbE SFP+ ports with legacy OM1/OM2 fiber support and MACsec 128-bit or 256-bit encryption, and 24x GbE SFP ports. It is targeted at customer looking for a cost effective 10GbE aggregation solution for small to midsize campus or data center networks that delivers enterprise features with L2/L3 capabilities, high availability and non-blocking line rate performance and combines chassis-level capability with the “pay as you grow” scalability of a stackable solution. This mid-market 1/10G aggregation switch is the first in its class to offer 100 GbE uplinks, enabling organizations to dramatically increase their network capacity to deploy high-performance wireless access and run next generation applications.

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RUCKUS ICX 7650 PRODUCT FAMILIY

Ruckus ICX 7650	
All Ruckus ICX 7650 models offer one modular slots in the front for interchangeable uplink modules, dual power supply slots, dual fan tray slots in the back, one RJ-45 Ethernet port for out-of-band network management, one USB Type-C port for console management, one RJ-45 port for serial console management, and one USB port for external file storage.	
	Ruckus ICX 7650-48P • 48x 10/100/1000 Mbps RJ-45 ports with 40 supporting PoE+ and 8 supporting PoE+, UPoE and PoH • Can stack on 4x40G or 2x100G rear facing QSFP ports, these ports can also be used as 2x40G uplinks when the switch is standalone • One slot for 2x40G or 4x10G front facing module • Up to 1500W PoE budget • 2x hot-swappable load sharing power supplies and 2x hot- swappable fan assemblies with reversible airflow options
	Ruckus ICX 7650-48ZP • 24x 10/100/1000 Mbps RJ-45 PoE+ ports • 24x 100/1000 Mbps 2.5/5/10 Gbps RJ-45 PoE+/PoH/UPoE ports • Can stack on 4x40G or 2x100G rear facing QSFP ports, these ports can also be used as 2x40G or 2x100G uplinks when switch is standalone • One slot for 1x 100G or 2x40G or 4x10G front facing module • Up to 1500W PoE budget • 2x hot-swappable load sharing power supplies and 2x hot- swappable fan assemblies with reversible airflow options
	Ruckus ICX 7650-48F • 24x 100/1000 Mbps SFP ports • 24x 1000 Mbps / 10 Gbps SFP+ ports • Can stack on 4x40G or 2x100G rear facing QSFP ports, these ports can also be used as 2x40G or 2x100G uplinks when switch is standalone • One slot for 1x 100G or 2x40G or 4x10G front facing module • 2x hot-swappable load sharing power supplies and 2x hot- swappable fan assemblies with reversible airflow options
	Ruckus ICX 7650 Rear View (all models) **The four rear facing QSFP ports can be configured as follows:** • 4x 40G QSFP+ stacking / 2x 40G QSFP+ uplink ports or • 2x100G QSFP28 stacking/uplink ports • Note: Front-facing optional module only enabled when rear ports are used for stacking. ICX 7650-48P only supports 2x40G rear facing uplink ports

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RUCKUS ICX 7650 POWER SUPPLIES OPTIONS	
	RPS16-E and RPS16-I AC PoE Power Supplies • 1000W power rating • 750W PoE budget (1500W with 2 power supplies) • Supported on the Ruckus ICX 7650-48P and ICX 7650-48ZP only • Power supply side exhaust front-to-back (RPS16-E) or power supply side intake back-to-front (RPS16-I) airflow
	RPS15-E and RPS15-I AC no-PoE Power Supplies • 250W power rating • Available for the Ruckus ICX 7650-48F only • Power supply side exhaust front-to-back (RPS15-E) or power supply side intake back-to-front (RPS15-I) airflow
	RPS16DC-E and RPS16DC-I DC PoE Power Supplies • 510W Power rating • 250W PoE budget (500W with 2 power supplies) • Supported on ICX7650-48F • Power supply side exhaust front-to-back (RPS16DC-E) or power supply side intake back-to-front (RPS16DC-I) airflow

RUCKUS ICX 7650 PORT MODULE OPTIONS	
	Ruckus ICX7650-1X100GQ • 1x40/100GE QSFP28 uplink port • Delivers up to 100 Gbps of uplink bandwidth • Can only be enabled when rear facing ports used for stacking • Not available on the ICX 7650-48P
	Ruckus ICX7650-2X40GQ • 2x40GE QSFP+ uplink port • Delivers up to 80 Gbps of uplink bandwidth • Can only be enabled when rear facing ports used for stacking
	Ruckus ICX7650-4X10GF • 4x10GE SFP+ uplink port with MACsec 128-bit or 256-bit support • Delivers up to 40 Gbps of uplink bandwidth • Can only be enabled when rear facing ports used for stacking

POE POWER TO SUPPORT NEXT-GENERATION EDGE DEVICES

The Ruckus ICX 7650 can deliver both power and data across network connections, providing a single-cable solution for the latest edge devices. In addition to supporting the Power over Ethernet (PoE/PoE+) standards, the ICX 7650 supports the pending IEEE 802.3bt standard. This highpower standard delivers up to 90 watts per port through a standard Ethernet cable, simplifying the wiring of next-generation Ethernet-connected devices such as large HD displays, video surveillance equipment, and VDI thin terminals. These ports are also compatible with uPoE (60 watts). The PoE/PoE+ and 802.3bt capabilities reduce the number of required power receptacles and power adapters while increasing reliability and wiring flexibility. With a 1,500-watt PoE budget per switch (with two power supplies), the Ruckus ICX 7650 PoE models can supply up to full Class 4 PoE+ power (30 watts) to all 48 port and 802.3bt power (90 watts) on eight ports on the ICX 7650-48P and the 24 Multigigabit ports on the ICX 7650-48ZP.

MULTIGIGABIT ETHERNET SUPPORT

Designed to handle 802.11ac Wave 2 access points, next-generation 802.11ax standard and future wireless technology evolution, the Ruckus ICX 7650-48ZP switch offers 24x 100/1000 Mbps/2.5/5/10 ports to connect Multigigabit wireless access points. Moreover, the switch's non-blocking line rate architecture offers up to 200 Gbps of uplink bandwidth, ensuring smooth end-to-end traffic flow from the wireless edge to the core.

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EEE POWER SAVINGS

The Ruckus ICX 7650 Switch supports the IEEE 802.3az standard for Energy Efficient Ethernet (EEE), reducing power consumption during periods of low utilization. Ports are placed into a low power mode when no data is being transmitted.

DATA CENTER TOP-OF-RACK SWITCH

With class-leading 10 GbE and 40/100 GbE port count, the Ruckus ICX 7650 is a great solution as a Top-of-Rack (ToR) switch in a mixed 1GbE/10GbE server connectivity environment. It is designed to fit in server racks, consuming only one rack unit and offering dual integrated power supplies and fan assemblies with front-to-back or back-to-front airflow for flexible cooling options. In data center environments where servers have a mixed of 1 GbE and 10 GbE network interfaces, the 1RU switch provides a cost-effective 1 GbE/10 GbE ToR switch with 40/100 GbE uplinks to connect to the data center spine switches.

ENTERPRISE-CLASS FEATURES ACROSS ALL RUCKUS ICX SWITCHES

The Ruckus ICX switch family delivers the enterprise class features for flexibility, scalability and simplified management.

Ruckus Campus Fabric technology delivers unmatched flexibility, scalability and simplified management for campus network deployments. Incorporating all of the ICX 7000 switch families with up to 1800 ports in a single logical domain, Campus Fabric allows customers the benefits of a traditional chassis, with the flexibility of stackable switches at a dramatically reduced Total Cost of Ownership (TCO).

- Advanced stacking goes beyond traditional stacking with capabilities that take flexibility, ease of management and cost effectiveness to then next level, including:
  - Stacking on standard Ethernet ports
  - Long-distance stacking
  - No hardware module required for stacking
  - In Service Software Upgrade (ISSU) to minimize downtime
  - Superior scalability with the industry-leading number of switches per stack
  - Stacking at the access, aggregation and core layers
- Enterprise-Class Availability to improve resiliency and minimize downtime, including:
  - Hitless stack failover
  - Hot-insertion/removal of stack members
  - Redundant power supplies
  - In Service Software Upgrades for switch stacks
- Unified wired and wireless network management with Ruckus SmartZone network controller:
  - Ruckus SmartZone centralizes management of the entire family of Ruckus switches and wireless Access Points with a single easy to deploy management platform
  - Discovers, monitor, and deploys configurations to groups of switches and wireless APs
- On-boarding and security policies across ICX switches and wireless networks.
- OpenFlow 1.3 protocol support in hybrid mode allows user to deploy traditional Layer 2/3 forwarding with Open-Flow on the same port for Software Defined Network (SDN) enabled programmatic control of the network
- Open Standards based management, monitoring and authentication
  - sFlow-based network monitoring to help analyze traffic statistics and trends on every link and overcome unexpected network congestion
  - Open-standards management includes Command Line Interface (CLI), Secure Shell (SSHv2), Secure Copy (SCP), and SNMPv3
  - Support for Access Controller Access Control System (TACACS/TACACS+) and RADIUS authentication helps ensure secure operator access
  - LLDP and LLDP-MED protocol support for configuring, discovering, and managing network infrastructure such as QoS, security policies, VLAN assignments, PoE power levels, and service priorities

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RUCKUS ICX 7650 FEATURE/MODEL COMPARISON

	Gigabit Access	Multigigabit Access	1/10G Aggregation
FEATURE	**Ruckus ICX 7650-48P**	**Ruckus ICX 7650-48ZP**	**Ruckus ICX 7650-48F**
Switching capacity (data rate, full duplex, stacking enabled)	696 Gbps	1.128 Tbps	1.128 Tbps
Forwarding capacity (data rate, full duplex, stacking enabled)	518 Mpps	839 Mpps	839 Mpps
Fixed ports: 10/100/1000 Mbps RJ45 downlinks	48	24	
Fixed ports: 100/1000 Mbps/2.5/5/10 Gbps RJ45 downlinks (full duplex only)		24	
Fixed ports: 1 Gbps SFP downlinks			24
Fixed ports: 1/10 Gbps SFP/SFP+ downlinks			24
Modular ports 1/10 Gbps SFP/ SFP+ uplinks (max.)	4	4	4
40 Gbps QSFP+ ports (max.)	2 Fixed[1] or 2 Modular	2 Fixed[1] or 2 Modular	2 Fixed[1] or 2 Modular
100 Gbps QSFP28 ports (max.)	2 Fixed (Stacking Only)	2 Fixed[2] or 1 Modular	2 Fixed[2] or 1 Modular
Stacking ports (max ports usable for stacking)	4×40G[1] QSFP+ or 2×100G[2] QSFP28		
PoE / PoE+ ports	40	40	
802.3bt ports (90 W per port) Compatible with PoE/PoE+/Cisco uPoE	8	24	
Maximum PoE Class 3 ports (15.4 W per port)	48	48	
Maximum PoE+ Class 4 ports (30 W per port)	48 (2 PSU)	48 (2 PSU)	
Base IPv4/v6 Layer 3 routing (static routing, RIP)	Standard		
Advanced IPv4/v6 Layer 3 routing (OSPF, BGP, VRRP, PIM, PBR, VRF)	With license		
Aggregated stacking bandwidth	2.4 Tbps		
Stacking density (maximum switches in a stack)	12		
Maximum stacking distance (distance between stacked switches)	10 km		
Campus Fabric	Fabric Control Bridge (CB)		

[1] Either 4x40G rear stacking ports + 2x 40G front modular uplink port, or 2x40G rear uplink ports. Front module disabled when rear ports used for uplinks
[2] Either 2x100G rear stacking ports + 1x 100G front modular uplink port, or 2x100G rear uplink ports. Front module disabled when rear ports used for uplinks

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RUCKUS ICX 7650 FEATURE/MODEL COMPARISON

	Gigabit Access	Multigigabit Access	1/10G Aggregation
	Ruckus ICX 7650-48P	**Ruckus ICX 7650-48ZP**	**Ruckus ICX 7650-48F**
FEATURE	**POWER**		
Power inlet (AC)	C14		
Input voltage/frequency	AC: 100 to 240 VAC @ 50 to 60 Hz		
Power supply rated maximum	2 x 1000W		2 x 250W
PoE power budget (two power supplies)	1500 W		
Switch power consumption[3] **(25°C) Idle (no PoE load)** **10% traffic[4] (full PoE load)** **100% traffic[4] (full PoE load)**	66 W 895 W 901 W	111 W 944 W 951 W	82 W 197 W 216 W
Airflow	front-to-back, or back-to-front (depending on power supplies and fans installed)		
Switch heat dissipation[3, 5] (25°C) **Idle (no PoE load)** **10% traffic[4] (full PoE load)** **100% traffic[4] (full PoE load)**	226BTU/hour 391 BTU/hour 408 BTU/hour	381 BTU/hour 635 BTU/hour 662 BTU/hour	281 BTU/hour 676 BTU/hour 741 BTU/hour
FEATURE	**ENVIRONMENT**		
Weight[3]	7.5 kg (16.53 lb)	8.01 kg (17.66 lb)	7.6 kg (16.75 lb)
Dimensions	440mm (17.323 in.) W x 406mm (15.984 in.) D x 44mm (1.732 in.) H; 1U		
Acoustics[3] (25°C, ISO 7779)	48.3 dBA	56.4 dBA	51.3 dBA
MTBF[3] (25°C)	213,026 hours	201,678 hours	243,130 hours

[3] Switch includes one AC power supply, one fan, one 2×40 GbE QSFP+ uplink module

[4] Traffic load on all ports connected with maximum possible PoE/PoE+ loads (if equipped).

[5] PoE power not included in switch heat dissipation figures since the heat is not dissipated at the switch.

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RUCKUS ICX 7650 SPECIFICATIONS

FEATURES	CAPABILITIES
Connector options	• 10/100/1000 Mbps, 2.5/5/10 Gbps ports: RJ-45 • 100 Mbps SFP ports • 1 Gbps SFP ports • 10 Gbps SFP+ ports • 40 Gbps QSFP+ ports • 100 Gbps QSFP28 ports • Out-of-band Ethernet management: 10/100/1000 Mbps RJ-45 • Console management: USB type C (Type C plug) and RJ45 • File Transfer: USB port, standard-A plug • For the latest information about supported optics, please visit www.ruckuswireless.com/optics.
DRAM **NVRAM (flash)** **Packet Buffer Size**	• 4 GB • 16 GB • 8 MB on ICX7650-48ZP and 48F, 5 MB on ICX7650-48P
Maximum MAC addresses	• 80,000
Maximum VLANs **Maximum PVLANs**	• 4095 • 256
Maximum STP (spanning trees)	• 254
Maximum VEs	• 512
Maximum routes (in hardware)	• 128K (IPv4) • 7K (IPv6) • 12,000 (Next Hop Addresses)
Trunking	• Maximum ports per trunk: 16 • Maximum trunk groups: 256
Maximum jumbo frame size	• 9,216 bytes
QoS priority queues	• 10 for Unicast and Multicast traffic
Multicast Groups	• 8192 (Layer 2) • 8192 (Layer 3)
VRF	• 128 instances
Layer 2 switching	• 802.1s Multiple Spanning Tree • 802.1x Authentication • Auto MDI/MDIX • BPDU Guard, Root Guard • Dual-Mode VLANs • MAC-based VLANs, Dynamic MAC-based VLAN activation • Dynamic Voice VLAN Assignment • Dynamic VLAN Assignment • Fast Port Span • GVRP: GARP VLAN Registration Protocol • IGMP Snooping (v1/v2/v3) • IGMP Proxy for Static Groups • IGMP v2/v3 Fast Leave • Inter-Packet Gap (IPG) adjustment • Link Fault Signaling (LFS) • MAC Address Filtering • MAC Learning Disable • MLD Snooping (v1/v2) • Multi-device Authentication • Per-VLAN Spanning Tree (PVST/PVST+/PVRST) • Mirroring - Port-based, ACL-based, MAC Filter-based, and VLAN-based • PIM-SM v2 Snooping • Port Loop Detection • Private VLAN • Remote Fault Notification (RFN) • Single-instance Spanning Tree • Trunk Groups (static, LACP) • Uni-Directional Link Detection (UDLD) • Metro-Ring Protocol (MRP) (v1, v2) • Virtual Switch Redundancy Protocol (VSRP) • Q-in-Q and selective Q-in-Q • VLAN Mapping • MCT (Ruckus Multi-Chassis Trunking) • Topology Groups

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RUCKUS ICX 7650 SPECIFICATIONS

FEATURES	CAPABILITIES	
Base Layer 3 IP routing	• IPv4 and IPv6 static routes – RIP v1/v2, RIPng • ECMP • Port-based Access Control Lists • Layer 3/Layer 4 ACLs	• Host routes • Virtual Interfaces • Routed Interfaces • Route-only Support • Routing Between Directly Connected Subnets
Premium Layer 3 IP routing (with software license)	• IPv4 and IPv6 dynamic routes • OSPF v2, OSPF v3 (IPv6) • PIM-SM, PIM-SSM, PIM-DM, PIM passive (IPv4/IPv6 multicast routing functionality) • PBR • Virtual Route Redundancy Protocol VRRP v3 (IPv6)	• VRRP-E (IPv4, IPv6) • BGP4, BGP4+ (IPv6) • GRE • IPv6 over IPv4 tunnels • VRF-lite (IPv4 and IPv6) • MSDP
Quality of Service (QoS)	• ACL Mapping and Marking of ToS/DSCP (CoS) • ACL Mapping and Marking of 802.1p • ACL Mapping to Priority Queue • Classifying and Limiting Flows Based on TCP Flags • DiffServ Support • Honoring DSCP and 802.1p (CoS)	• MAC Address Mapping to Priority Queue • Priority Queue Management using Weighted Round Robin (WRR), Strict Priority (SP), and a combination of WRR and SP
Traffic management	• ACL-based inbound rate limiting and traffic policies • Broadcast, multicast, and unknown unicast rate limiting	• Inbound rate limiting per port • Outbound rate limiting per port and per queue
Security	• MACsec • 802.1X authentication • MAC authentication • Flexible authentication • Web authentication • DHCP snooping • Dynamic ARP inspection • Neighbor Discovery (ND) Inspection • Tri-level Access Mode (EXEC, Privileged EXEC and Global Configuration) • EAP pass-through support • EEE 802.1X username export in sFlow • Protection against Denial of Service (DoS) attacks Authentication, Authorization, and Accounting (AAA)	• MAC Address Locking MAC Port Security • Advanced Encryption Standard (AES) with SSHv2 • RADIUS/TACACS/TACACS+ • Secure Copy (SCP) • Secure Shell (SSHv2) • Local Username/Password • Change of Authorization (CoA) RFC 5176 • Trusted Platform Module • Protected ports • RADSEC (RFC 6614) • Encrypted Syslog (RFC 5425)
SDN features	• OpenFlow v1.0 and v1.3 • OpenFlow with hybrid port mode	• Operates with OpenDaylight SDN Controllers and the applications running on the controller
IEEE standards compliance	• 802.1AB LLDP • 802.1D MAC Bridging • 802.1p Mapping to Priority Queue • 802.1s Multiple Spanning Tree (MST) • 802.1w Rapid Reconfiguration of Spanning Tree • 802.1x Port-based Network Access Control (PNAC) • 802.3 Carrier Sense Multiple Access/Collision Detection (CSMA/CD) • 802.3ab 1000BASE-T • 802.1 AX-2008 Link Aggregation • 802.3ae 10 Gigabit Ethernet • 802.3af Power over Ethernet	• 802.3at Power over Ethernet Plus • 802.3bt 4-Pair Power over Ethernet (IEEE ratification pending) • 802.3u 100Base-TX • 802.3x Full duplex and Flow Control • 802.3z 1000Base-SX/LX • 802.3 MAU MIB (RFC 2239) • 802.3ba 40 and 100 Gbps Ethernet • 802.1AE-MACsec* (with license) • 802.3az Energy Efficient Ethernet • 802.1Q VLAN Tagging • 802.1BR Bridge Port Extension
IETF RFC standards compliance	For a complete list of RFCs supported by the Ruckus FastIron® software platform, please consult the "FastIron Features and Standards Support Matrix" document available from support.ruckuswireless.com.	

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RUCKUS ICX 7650 SPECIFICATIONS

FEATURES	CAPABILITIES
High availability	• Redundant hot-swappable power supplies • Hot-swappable fan trays • Layer 3 VRRP/VRRP-E protocol redundancy • Real-time state synchronization across the stack • Hitless failover and switchover from master to standby stack controller • Hot insertion and removal of stacked units • Layer 2 VSRP switch redundancy • In Service Software Update (ISSU)
Management	• DHCP Auto Configuration • Configuration Logging • Digital Optical Monitoring • Display Log Messages on Multiple Terminals • Embedded Web Management (HTTP/HTTPS) • Embedded DHCP Server • Industry-standard Command Line Interface (CLI) • Ruckus SmartZone Network Controller (sold separately) • Easy activation of optional software features • USB file management and storage • Boot from USB storage • Macro for batch execution • Out-of-band Ethernet Management • ERSPAN support for remote traffic monitoring • RSPAN • TFTP • TELNET Client and Server • Bootp SNMPv1/v2c • DHCP Server and DHCP Relay • SNMPv3 Intro to Framework • Architecture for Describing SNMP Framework • SNMP Message Processing and Dispatching • SNMPv3 Applications • SNMPv3 User-based Security Model • SNMP View-based Access Control Model SNMP • sFlow • Network Time Protocol (NTP) • Multiple Syslog Servers • SCP • EOAM (EFM-OAM) • Virtual Cable Tester (VCT) • For Management MIB, please consult the “FastIron MIB Reference” document available from support.ruckuswireless.com.

FEATURES	ENVIRONMENT
Temperature	Operating temperature: 0°C to 45°C/32°F to 113°F at sea level Storage temperature: −40°C to 70°C/−40°F to 158°F
Humidity	Operating relative humidity: 10% to 90% at 50°C, non-condensing Non-operating relative humidity: 5% to 95% at 70°C, non-condensing
Altitude	Operating altitude: 10,000 ft. (3,000 m) maximum Storage altitude: 39,000 ft. (12,000 m) maximum

FEATURES	COMPLIANCE/CERTIFICATION
Electromagnetic emissions	FCC Class A (Part 15); EN 55022/CISPR-22 Class A; VCCI Class A; ICES-003 Electromagnetic Emission; AS/NZS 55022; EN 61000-3-2 Power Line Harmonics; EN 61000-3-3 Voltage Fluctuation and Flicker EN 61000-6-3 Emission Standard
Safety	CAN/CSA-C22.2 NO. 60950-1-07; UL 60950-1; IEC60950-1; EN 60950-1:2006 Safety of Information Technology Equipment; EN 60825-1 Safety of Laser Products
Immunity	EN 61000-6-1 Generic Immunity and Susceptibility; EN 55024 Immunity Characteristics; EN 61000-4-3 Radiated, Radio Frequency, Electromagnetic Field; EN 61000-4-4 Electrical Fast Transient; EN 61000-4-5 Surge; EN 61000- 4-6 Conducted Disturbances Induced by Radio-Frequency Fields; EN 61000-4-8 Power Frequency Magnetic Field; EN 61000-4-11 Voltage Dips and Sags
Environmental regulatory compliance	RoHS-compliant (6 of 6); WEEE-compliant
Vibration	IEC 68-2-36, IEC 68-2-6
Shock and drop	IEC 68-2-27, IEC 68-2-32

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RUCKUS ICX 7650 ORDERING INFORMATION

PART NUMBER	SWITCH BUNDLES
ICX7650-48ZP-E	48-port; 24-port 100MbE/1GbE/2.5GbE/5Gb E/10GbE POH, 24-port 1 GbE switch PoE+, 4xQSFP (either 2x100G or 4x40G active), modular slot. Bundle includes one 1000W AC power supply and one fan, front to back airflow, port modules sold separately.
ICX7650-48P-E	48-port 1 GbE switch PoE+, 4xQSFP (either 2x100G or 4x40G active), modular slot. bundle includes one 1000W AC power supply and one fan, front to back airflow, port modules sold separately.
ICX7650-48F-E	48-port; 24-port 1/10GbE SFP+, 24-port 1 GbE SFP, 4xQSFP (either 2x100G or 4x40G active), modular slot. fiber switch bundle includes one 250W AC power supply and one fan, front to back airflow, port modules sold separately.
ICX7650-48ZP-E2	48-port; 24-port 100MbE/1GbE/2.5GbE/5Gb E/10GbE POH, 24-port 1 GbE switch PoE+, 4xQSFP (either 2x100G or 4x40G active), modular slot bundle includes two 1000W AC power supplies and two fans, front to back airflow, port modules sold separately.
ICX7650-48P-E2	48-port 1 GbE switch PoE+, 4xQSFP (either 2x100G or 4x40G active), modular slot bundle includes two 1000W AC power supplies and two fans, front to back airflow, port modules sold separately.
ICX7650-48F-E2	48-port; 24-port 1/10GbE SFP+, 24-port 1 GbE SFP, 4xQSFP (either 2x100G or 4x40G active), modular slot fiber switch bundle includes two 250W AC power supplies and two fans, front to back airflow, port modules sold separately.

PART NUMBER	SWITCH BUNDLES WITH 3 YEARS REMOTE SUPPORT
ICX7650-48ZP-E-RMT3	48-port; 24-port 100MbE/1GbE/2.5GbE/5GbE/10GbE POH, 24-port 1GbE switch PoE+, 4xQSFP (either 2x100G or 4x40G active), modular slot bundle includes one 1000W AC power supply and one fan, front to back airflow, port modules sold separately, 3 years 24x7 remote support.
ICX7650-48P-E-RMT3	48-port 1 GbE switch PoE+,4xQSFP (either 2x100GbEor 4x40GbE active), modular slot bundle includes one1000W AC power supply and one fan, front to back airflow, port modules sold separately, 3 years 24x7remote support..
ICX7650-48F-E-RMT3	48-port; 24-port 1/10GbE SFP+, 24-port 1 GbE SFP, 4xQSFP (either 2x100G or 4x40G active), modular slot fiber switch bundle includes one 250W AC power supply and one fan, front to back airflow, port modules sold separately, 3 years 24x7 remote support.

PART NUMBER	BARE SWITCHES
ICX7650-48ZP	48-port switch: 24-port 100MbE/1GbE/2.5GbE/5GbE/10GbE POH and 24-port 1GbE. PoE+, 4xQSFP (either 2x100G or 4x40G active), modular slot, no PSU, no fans, no port module.
ICX7650-48P	48-port 1 GbE switch PoE+, 4xQSFP (either 2x100G or 4x40G active), modular slot, no PSU, no fans, no port module.
ICX7650-48F	48-port; 24-port 1/10GbE SFP+, 24-port 1 GbE SFP, 4xQSFP (either 2x100G or 4x40G active), modular slot fiber switch, no PSU, no fans, no port module.

PART NUMBER	POWER SUPPLIES AND FANS
RPS15-E	ICX7650/7450/6610/6650 NON-POE 250W AC PSU, exhaust airflow, front to back airflow
RPS15-I	ICX7650/7450/6610/6650 NON-POE 250W AC PSU, intake airflow, back to front airflow
RPS16-E	ICX7650/7450/6610 POE 1000W AC PSU, exhaust airflow, front to back airflow
RPS16-I	ICX7650/7450/6610 POE 1000W AC PSU, intake airflow, back to front airflow
RPS16DC-E	ICX 7650/7450/6610 POE 510W DC PSU, exhaust airflow, front to back airflow
RPS16DC-I	ICX 7650/7450/6610 POE 510W DC PSU, intake airflow, back to front airflow
ICX-FAN12-E	ICX 7650 exhaust airflow fan, front to back airflow (two fans required when using two power supplies)
ICX-FAN12-I	ICX 7650 intake airflow fan, back to front airflow (two fans required when using two power supplies)

PART NUMBER	PORT MODULES
ICX7650-1X100GQ	ICX 7650 1-port 100GbE QSFP28 Module
ICX7650-2X40GQ	ICX 7650 2-port 40GbE QSFP+ Module
ICX7650-4X10GF	ICX 7650 4-port 1/10GbE SFP+ Module

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RUCKUS ICX 7650 ORDERING INFORMATION

PART NUMBER	FEATURE LICENSE AND ACCESSORIES
ICX7650-PREM-LIC	ICX 7650 advanced L3 License adds support for OSPF, BGP VRRP, PIM, PBR, VRF
ICX-MACSEC-LIC	ICX MACsec license adds support for 128/256 bit MACsec encryption to ICX 7650
ICX7000-RMK	FRU, RACK MOUNT KIT,2 POST ICX7000 SERIES
XBR-R000295	FRU, RACK MOUNT KIT,4 POST 24-32 DEPTH RCK

OPTICS	
See Optics Datasheet at www.ruckuswireless.com/optics	Ruckus offers a unique set of high-performance, reliable, and cost-effective optical transceivers to help enterprises and service providers meet the challenges of diverse network topologies. To ensure maximum quality, Ruckus selects and tests the most reliable, highest-performing optical transceivers on the market, and then warrants their availability, capacity, and performance in Ruckus® product." for a the specific list of optics supported by each ICX product see the Optics Datasheet at www.ruckuswireless.com/optics.

MANAGEMENT SOFTWARE	
See SmartZone Datasheet at www.ruckuswireless.com/smartzone	Ruckus SmartZone centralizes management of the entire family of Ruckus switches and wireless Access Points with a single easy to deploy management platform. It simplifies network set-up and management, enhances security, streamlines troubleshooting and eases upgrades. SmartZone Network Controllers are available in both appliance and virtual appliance form. For more information, go to www.ruckuswireless.com/smartzone.

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ORDERING NOTES

Customers have two options when ordering a Ruckus ICX 7650 Switch. They can select one of the pre-built units from the "Switch Bundles" section, or they can build their own custom unit by selecting a "Bare Switch" and adding their choice of power supplies, fans, and port modules.

Pre-built units ordered from the "Switch Bundles" section include a power cord, two-post rack mounting brackets, and a USB serial console cable. Units ordered from the "Bare Switches" section include two-post rack mounting brackets and a USB serial console cable.

AC power supplies ordered separately include a power cord. Stacking cables must be ordered separately.

WARRANTY

Ruckus ICX 7650 Switches are covered by the Ruckus Assurance Limited Lifetime Warranty. For details, visit www.ruckuswireless.com/warranty.

BEST-IN-CLASS SUPPORT

Ruckus ICX 7650 switches come with 90 days of free technical support from the Ruckus Technical Assistance Center (TAC). For continued access to the TAC past the initial 90 days, customers must purchase a Ruckus Technical Support contract. For details, visit support.ruckuswireless.com/programs.

LEGAL DISCLAIMER

Product features, functionality and specifications may change or be discontinued without notice. Nothing in this document shall be deemed to create a warranty of any kind, either express or implied, statutory or otherwise, including but not limited to, any implied warranties of merchantability, fitness for a particular purpose, non- infringement of third-party rights or availability with respect to any products and services.

Refer to www.ruckuswireless.com for the latest version of this document.

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